

Metal packaging — Round lever-lid metal containers for surface coatings — Specification

ICS 55.120

Confirmed February 2008

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PKW/2, Primary Packaging, upon which the following bodies were represented:

- Association of Drum Manufacturers
- BAMA — Brit. Aerosol Manufacturer’s Association
- British Beer and Pub Association
- British Coatings Federation Ltd
- British Plastics Federation
- Campden and Chorleywood Food Research
- Camping and Outdoor Leisure Association
- Consumer Policy Committee of BSI
- DTI — Consumer Affairs and Competition
- DTI — Consumer Safety Unit
- Dairy Industry Federation
- Food and Drink Federation
- HSE — Health and Safety Executive
- LP Gas Association
- Metal Packaging Manufacturers Association
- Trading Standards Institute

This British Standard, having been prepared under the direction of the Consumer Products and Services Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 28 November 2002

© BSI 28 November 2002

First published October 1953
Second edition September 1965
Third edition November 1970
Fourth edition March 1990

The following BSI references relate to the work on this British Standard:
Committee reference PKW/2
Draft for comment 98/718514 DC

ISBN 0 580 40751 9

Amendments issued since publication

Date	Amd. No.	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Dimensions and ullage	1
5 Materials	1
6 Printing	2
7 Performance	2
Annex A (normative) Methods for the determination of gross lidded capacity	4
Annex B (informative) Recommended volumes and dimensions	5
Annex C (informative) Recommendations on information to be agreed between the purchaser and supplier	7
Annex D (normative) Determination of print adhesion and hardness	7
Annex E (informative) Method of determining the effect of spills of a product on the legibility of information printed on the container	9
Annex F (normative) Methods for the detection of leakage	9
Annex G (normative) Method of test for lid fit	11
Annex H (normative) Methods of test for lid retention for containers of nominal volume not exceeding 5 l	11
Annex I (normative) Method of test for stacking performance	12
Annex J (normative) Method of test for handle strength	13
Annex K (normative) Method of exposure to UV light for plastics handles	19
Annex L (informative) Corrosion test	20
Bibliography	22
Table A.1 — Precision of weighing apparatus	4
Table B.1 — Recommended volumes and dimensions of containers	5
Table H.1 — Drop height for lid retention test	11
Table I.1 — Loads for conventional stack test	12
Table J.1 — Peak loads for snatch tests	14
Figure B.1 — Diameter and height	6
Figure J.1 — Typical apparatus for handle tensile strength test (vertical test position shown)	15
Figure J.2 — Method of applying load for handle tensile strength test	16
Figure J.3 — Change blocks for testing tensile strength of handle	17
Figure J.4 — Handle grip for snatch tests	18
Figure J.5 — Typical apparatus for snatch tests	19

Foreword

This British Standard has been prepared by Technical Committee PKW/5/22. It supersedes BS 1262:1989, which is withdrawn.

The main change from the 1989 edition is that this edition is less prescriptive and more performance based. Non-metallic materials are allowed for some components and the container dimensions are now only recommended. The opportunity has been taken to make editorial changes to bring the standard in line with current drafting practices.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Attention is drawn to the following statutory regulations concerning the packaging and carriage of hazardous materials:

- The Carriage of Dangerous Goods (Classification, Packaging and Labelling) and Use of Transportable Pressure Receptacles Regulations 1996 and amendments [1];
- The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 [2].

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 22, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates the most recent changes by amendment.

1 Scope

This British Standard specifies requirements for round metal containers with lever lids. It applies to containers with nominal volumes of between 125 ml and 10 l, and which are intended primarily for paints and other surface coatings.

Performance requirements and related methods of test are included. These cover freedom from leaks, stacking strength, handle strength, lid security, print adhesion and resistance to corrosion.

The drop and topple tests for lid security apply only to containers of nominal volume not exceeding 5 l (see 7.3).

This standard does not cover the suitability of containers for use with any particular product.

Various methods of test for filled packages are given in the Bibliography.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1006:B01C:LFS7, *Methods of test for colour fastness of textiles and leather — B01: Blue wool standards — LFS7: Reference standard for no. 7.*

BS 2782-5:Method 540B:1982 (ISO 4892:1981), *Methods of testing plastics — Part 5: Optical and colour properties, weathering — Method 540B: Methods of exposure to laboratory light sources (xenon arc lamp, enclosed carbon arc lamp, open-flame carbon arc lamp, fluorescent tube lamps).*

BS EN 60454-2, *Specifications for pressure-sensitive adhesive tapes for electrical purposes — Part 2: Methods of test.*

3 Terms and definitions

For the purposes of this British Standard, the following term and definition applies.

3.1

ullage

gross lidded capacity minus the nominal volume

4 Dimensions and ullage

The minimum ullage, calculated from the gross lidded capacity determined in accordance with Annex A, shall be 7.5 % of the nominal volume.

NOTE Recommended dimensions for round, cylindrical, lever-lid containers are given in Annex B.

5 Materials

Except for its components, the container shall be constructed from coated steel.

NOTE 1 Components, e.g. handles, closures, overclosures, may be constructed of non-metallic materials.

NOTE 2 All separable non-metallic components should carry the appropriate recycling identification marks, e.g. in accordance with BS EN ISO 11469.

NOTE 3 All material used in the manufacture of the container should be compatible with the intended contents and suitable for the intended end use. Recommendations on information to be agreed between the purchaser and supplier are given in Annex C.

6 Printing

If the container is supplied with a printed decoration:

- a) no trace of the print shall be removed from the container when it is tested in accordance with **D.1**; and
- a) the print hardness shall be at least grade B when tested in accordance with **D.2**.

NOTE It is recommended that a printed container be tested in accordance with Annex E to ensure that contact with the contents does not impair the legibility of the printed information.

7 Performance

NOTE Attention is drawn to The Carriage of Dangerous Goods (Classification, Packaging and Labelling), etc. Regulations [1], which require a container to be suitable for normal conditions of filling, storage, transport and use without suffering undue damage, collapse, leakage or detriment to its external appearance or decoration.

7.1 Freedom from leaks

When tested in accordance with any of the methods given in Annex F, the container shall be leak-free.

7.2 Lids

7.2.1 Lid fit

When tested in accordance with Annex G, the lid shall not be permanently displaced and the container shall not be permanently deformed.

7.2.2 Fitting of lids

The lid shall be capable of being fitted without the container collapsing or the lid subsequently “popping-off”. The necessary closing force shall not exceed 1.0 kN applied for not more than 0.5 s.

7.2.3 Nesting characteristics

Lids shall be capable of nesting, without locking, when stacked as supplied for loading into conventional fitting systems.

NOTE Lids stacked as supplied should be capable of being loaded into lidding machines without the stacks collapsing.

7.2.4 Opening

After fitting with a force of 1 kN, the lid shall be removable using a 10 mm flat-bladed screwdriver or the opening tool supplied, without damaging or distorting the container.

7.2.5 Refitting

The lid shall be capable of being refitted manually at least twice, without the use of any tool and without damaging or distorting the container.

NOTE 1 Some containers may need to withstand multiple opening and refitting of the lid, depending on the envisaged end use.

NOTE 2 Some reduction in performance after the lid has been manually refitted is permissible.

NOTE 3 Manual opening and refitting operations should be tested by non-professional personnel.

7.2.6 Lid retention for containers of nominal volume not exceeding 5 l

When tested in accordance with Annex H, none of the containers shall exhibit any sign of leakage, through lid displacement or failure of the container body, after the drop test (**H.3**) and after the topple test (**H.4**).

7.3 Stacking

When tested in accordance with Annex I, containers shall exhibit no deformation after either the conventional stack test or the offset stack test.

7.4 Handles

7.4.1 *Strength*

After each test specified in Annex J, the handle shall be:

- a) unbroken;
- b) secure on both sides; and
- c) capable of supporting the container plus the mass of the intended contents.

After each test specified in Annex J the container shall still conform to requirements of **7.1**.

NOTE Some distortion of the components as a result of the test is permissible.

7.4.2 *UV resistance*

Plastics handles and handle-securing units shall still conform to **7.4.1** after exposure to UV light in accordance with Annex K.

7.5 Corrosion

Annex L gives a recommended method of testing corrosion resistance. Exposure time and pass/fail criteria shall be subject to agreement between the supplier and customer.

Annex A (normative)

Methods for the determination of gross lidded capacity

A.1 General

The gross lidded capacity of the container shall be determined as described in either A.2 or A.3.

A.2 Method A

A.2.1 Apparatus

A.2.1.1 Drill.

A.2.1.2 *Weighing apparatus*, of sufficient precision to achieve the accuracy specified in Table A.1.

A.2.1.3 *Clean water*, at a temperature of $(23 \pm 2) ^\circ\text{C}$.

A.2.2 Procedure

A.2.2.1 Using A.2.1.1 drill two holes, 3 mm to 6 mm in diameter, in the bottom of the container about 7 mm apart and each as close as possible to the circumference of the base. Remove the burrs.

A.2.2.2 Fit the lid, ensuring that it is fully secured.

A.2.2.3 Determine the mass of the closed empty container, m_1 , in grams, using weighing apparatus (A.2.1.2).

A.2.2.4 Fill the container with water (A.2.1.3) through one of the holes, using a narrow jet, with the container inclined at an angle to the vertical so that the holes are as high as possible.

A.2.2.5 When water runs out of the second hole, close the holes with the fingers and shake the container gently to displace any trapped air; then complete the filling with the container inclined at an angle as before. On completion of filling, stand the container in a vertical position with the holes uppermost.

A.2.2.6 Carefully remove all surplus water from the outside of the container.

A.2.2.7 Determine the mass of the filled container, m_2 , in grams, using weighing apparatus (A.2.1.2).

A.2.3 Test result

Determine the numerical value of the gross lidded capacity of the container in millilitres by calculating the difference between the masses ($m_2 - m_1$) in grams.

Table A.1 — Precision of weighing apparatus

Mass, m g	Tolerance
$0 < m \leq 500$	± 0.5
$500 < m \leq 2\,500$	± 1.0
$2\,500 < m \leq 5\,000$	± 2.5
$5\,000 < m$	± 5.0

A.3 Method B

A.3.1 Apparatus

A.3.1.1 Drill.

A.3.1.2 *Weighing apparatus*, of sufficient precision to achieve the accuracy specified in Table A.1.

A.3.1.3 *Bucket or tank*, filled with A.3.1.4 and large enough to allow complete immersion of the sample container.

A.3.1.4 *Clean water*, at a temperature of $(23 \pm 2) ^\circ\text{C}$.

A.3.2 Procedure

A.3.2.1 Using **A.3.1.1** drill two holes, 3 mm to 6 mm in diameter, in the bottom of the container, diametrically opposite each other and each as close as possible to the circumference of the base. Remove the burrs.

A.3.2.2 Fit the lid, ensuring that it is fully secured.

A.3.2.3 Determine the mass of the closed empty container, m_1 , in grams, using weighing apparatus (**A.3.1.2**).

A.3.2.4 Immerse the container, bottom upwards, in the bucket or tank (**A.3.1.3**) of water (**A.3.1.4**). Allow the container to fill with water.

A.3.2.5 Tilt the container slightly to dispel any residual pocket of air. Withdraw the container vertically.

A.3.2.6 Carefully remove all surplus water from the outside of the container.

A.3.2.7 Determine the mass of the filled container, m_2 , in grams, using weighing apparatus (**A.3.2.1**).

A.3.3 Test result

Determine the numerical value of the gross lidded capacity of the container in millilitres by calculating the difference between the masses ($m_2 - m_1$) in grams.

Annex B (informative)

Recommended volumes and dimensions

The container sizes given in Table B.1 are recommended because they are compatible with existing filling and packaging machinery, and with existing facilities for storage, handling and distribution. The dimensions included in Table B.1 are indicated on Figure B.1.

Table B.1 — Recommended volumes and dimensions of containers

Nominal volume ml	Internal diameter, d mm	External height, h mm
125	59	58
250	74	74
375	99	64
500	89	100
750	99	119
1 000	108	131
1 000	113	120
2 500	153	157
3 500	165	190
5 000	176	233
10 000	216	299
10 000	255	255
NOTE The nominal volumes shown in bold type are the preferred sizes produced by UK manufacturers.		